DOCUMENT RESUME

ED 066 289 RC 006 420

TITLE	CVAE [Coordinated Vocational-Academic Education] Academic Curriculum Project. Evaluation Report, 1971-72.
INSTITUTION	Education Service Center Region 1, Edinburg, Tex.
SPONS AGENCY	Texas Education Agency, Austin. Dept. of Occupational and Technical Education.
PUB DATE	72
NOTE	78p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Academic Achievement; *Academic Education; Audiovisual Aids; *Curriculum Development; Evaluation; Individualized Instruction; *Junior High School Students; Language Arts; Mathematics Curriculum; *Mexican Americans; Program Descriptions; Science Curriculum; Social Studies; *Vocational Education
IDENTIFIERS	*Texas

ABSTRACT

The second year of the Coordinated Vocational-Academic Education (CVAE) Academic Curriculum Project, Region One Education Service Center, was devoted to the production of instructional materials and to the field testing of the instructional system. Having as its target population junior high school CVAE students, the project's field test involved more than 120 students and 6 academic teachers in the Austin Junior High School, Pharr-San Juan-Alamo Independent School District. Eighth grade students participated in the mathematics, social studies, and language arts curricula, and 9th grade students participated in the mathematics and science curricula. Developed around student performance objectives, the system provides for individual learning rates. Students receive instruction via filmstrips, cassette tapes, and realia, as well as by paper-and-pencil activities. They proceed from simpler to more complex tasks as they move individually from one objective to the next. Field test students, typically disenchanted with formal schooling, were involved in the planned learning activities up to 71% of the time and in individual work up to 57% of the time. Absenteeism and disciplinary referrals dropped. Ninth grade students' more positive attitude toward science was documented. Mastery over specific performance objectives, from 88.7% to 99.8% in the different curriculum areas, was accomplished. It was concluded that the instructional system is viable, and it was recommended that the project be continued and expanded. (Author/NQ)

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FIELD TEST REPORT 1971-72

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CVAE ACADEMIC CURRICULUM PROJECT

Funded by the Texas Education Agency, Occupational Education and Technology

EVALUATION REPORT, 1971-72

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CVAE ACADEMIC CURRICULUM PROJECT
EVALUATION REPORT, 1971-72

ABSTRACT

The second year of the CVAE Academic Curriculum Project, Region One Education Service Center, was devoted to the production of instructional materials and to the field testing of the instructional system.

Having as its target population junior high school CVAE students, the project's field test involved more than 120 students at its primary site, and six academic teachers. Eighth grade students participated in the mathematics, social studies and language arts curricula, and ninth grade students participated in the mathematics and science curricula.

Developed around student performance objectives, the system provides for individual learning rates. Students receive instruction via filmstrips, cassette tapes, and realia, as well as by paper-and-pencil activities. They proceed from simpler to more complex tasks as they move individually from one objective to the next.

Field test students, typically disenchanted with formal schooling, were involved in the planned learning activities up to 71% of the time; they were involved in individual work up to 57% of the time. Absenteeism and disciplinary referrals dropped. Ninth grade students' more positive attitude toward science was documented. Mastery over specific performance objectives, from 88.7% to 99.8% in the different curriculum areas, was accomplished.

It is concluded that the instructional system is viable, and it is recommended that the project be continued and expanded.

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CVAE ACADEMIC CURRICULUM PROJECT
EVALUATION REPORT, 1971-72

INTRODUCTION

Under a grant from the Texas Education Agency, Region One Education Service Center is developing a curriculum system for the academic subjects of the Coordinated Vocational-Academic Education (CVAE) program of the State. Nearing the end of its second year, the project is the direct responsibility of the Instructional Services Division, Occupational Education and Technology component.

The target population of the CVAE program in Texas is described as follows:

> These students are usually low or under-achievers within an I.Q. range of 70 to 95. They have no personal goals in life, lack self-confidence, and their abilities in communication skills are almost non-existent. Attendance in school is irregular, sometimes for real, but most of the time for imaginary reasons. They frequently come from low income families that are long-time recipients of welfare or other subsistence type aid. They fail most of their courses for various reasons. Surprisingly however, they are usually normal or above in potential ability to achieve satisfactorily. Specifically, the requirements for students to be enrolled are at least 14 years of age, behind one or more years academically or in achievement level, and able to profit from the instructions.[1]

Students enrolled in the CVAE program devote two class periods (110 minutes) daily to pre-employment shop or to a cooperative part-time training program. The academic phase of the program, which occupies students the remainder of each school day, is required to be

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[1] Coordinated Vocational-Academic Education, Texas Education Agency, Austin, Texas. (Mimeographed.)

a modified academic curriculum departing from traditional standards and be taught on an ungraded basis. Language, mathematics, science, and social studies must be adapted to the level and learning ability of the students. Students handicapped in reading ability must be provided remedial reading instruction instead of traditional English. Students of low achievement in mathematics, science, or social studies must be given remedial instruction. Other academic provisions are:

1. Curricula must be flexible and be taught at the achievement level of the student.

2. Remedial work shall be given students in areas of low level achievement parallel with identified ability.

3. Primary emphasis will be on the basic tools of language arts and mathematics. The basic skills taught will be in reading, writing, speaking, listening, and arithmetic areas.

4. Academic instruction content will be functional with practical application to occupational training whenever possible.[2]

Within the framework of these guidelines the Region One CVAE Academic Curriculum System is being developed.

The first year was devoted primarily to developing the rationale and format for the curriculum system. Early in the development of the project two of the decisions made were: (1) the program would have to be individualized in order to meet the needs of CVAE students; (2) the program would have to grow out of carefully selected learning objectives, stated in terms of student performance so that meaningful learning activities could be devised and student progress assessed.

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[2] Ibid.

Description of the CVAE Academic System

It was therefore determined that curriculum guides in each of the four academic curriculum areas (math, language arts, science and social studies) would be developed around areas of study (see lists of areas of study in the Appendix). The final plan calls for twelve areas of study in each of the four areas, with each area of study consisting of a sequence of behavioral objectives arranged from simpler to more difficult tasks. The twelve areas of study will comprise a three-year curriculum for grade levels seven, eight and nine.

Each objective is individualized so that each student is able to progress at his own rate. The student receives instructions for activities via filmstrips and cassette tapes, works at his own learning rate, and is not frustrated by either a too-fast or too-slow class.

Inexpensive learning carrells and tables facilitate individualized learning.

The materials included in a complete area of study are quite extensive. A booklet listing objectives, pre-tests, post-tests, activities and procedures for activities forms the nucleus around which the program is developed. Accompanying realia are developed from lists and instructions, and pre- and post-test sheets and student progress record sheets are reproduced from sets of masters.

First Year

During the first year of the project, the staff consisted of a

coordinator-writer, three consultant-writers, one secretary, a materials manager, and two parttime workstudy students who assisted with the production of materials.

This staff, besides developing the rationale and format for the curriculum system, produced a sufficient number of areas of study to make possible a field test during the second year of the project.

Second Year

In order to carry out the objectives of the project during its second year, the staff was expanded to include an artist, an additional secretary, a parttime artist, and a field test evaluator. By the end of the second year this staff had completed sixteen areas of study, with guide books, prototypes of realia, media, and supplementary directions for the implementation of the program in the classroom. In addition, it had begun to evolve models for teacher training and for the dissemination of the curriculum system.

While the writing of additional areas of study and the production of materials continued, the field test was conducted, with six teachers and approximately 120 students, in the Austin Junior High School, Pharr-San Juan-Alamo Independent School District, in the lower Rio Grande Valley of Texas.

Located in an agricultural community, the Pharr-San Juan-Alamo district enrolled approximately 11,400 students in 1971-72, 87% of them Mexican American. Hidalgo County, in which the district is located, is designated as an economically depressed county.

Austin Junior High School, where the field test was conducted, is located at San Juan. The school operates in a modern air conditioned building, one wing of which is devoted to vocational courses. Students in the CVAE program were enrolled in one of four vocational clusters--Commercial Display and Decoration, General Construction Trades, General Mechanical Repair, or Horticulture. All of the four eighth grade and four ninth grade CVAE units at Austin participated in the field test.

CVAE academic teachers who participated in the field test included one teacher in language arts (four eighth grade classes), one in social studies (two eighth grade classes), one in science (four ninth grade classes), and three in mathematics. One math teacher had four eighth grade classes and was teamed with a second teacher in a double section of ninth grade students. The second teacher was teamed with a third in another double section of ninth grade students.

PROCEDURE

Teacher Training

Before students came to school to begin the 1971-72 school year, four field test teachers engaged in two days of training preparatory to using the Region One system (they received an average of an additional two days' training later in the year). For the first day or two after the semester began, the writers of the program assisted teachers in implementing the program and were on hand to help overcome any unforseen difficulties.

Data Collected

Before students began using the curriculum system, they completed a short questionnaire which was designed to measure students' (1) preferences for school subjects, (2) self concept of school ability, and (3) attitude toward school. The same questionnaire was administered at the end of the semester.

Data which would indicate students' involvement in the learning activities, and which would indicate difficulties in the system or in its implementation, were collected on the form OBSERVATION OF STUDENTS' CLASSROOM BEHAVIOR (see Figure 1, page 9). These data provided answers to several questions of interest: Were students involved rather than passive? Was instruction individualized? What aspects of the system would the staff need to review for possible revision?

Materials were evaluated by the field test teachers by means of check lists and comments which were included in teachers' guide books. These data were also used by the staff in planning revisions of the guide books. In addition, all six of the field test teachers engaged in a debriefing session at the end of the semester. At this session they offered additional suggestions for making the system operate more smoothly.

Throughout the period of the field test (the first semester of the 1971-72 school year) comments of teachers, administrators, students and visitors to the field test site were recorded.

Although the primary purpose of the field test was not to determine student achievement, it was nevertheless possible to gather and

analyze some data which would indicate some achievement trends. Inasmuch as the learning activities were tied to specific behavioral objectives and were therefore criterion-referenced, no effort was made to measure student progress by means of standardized achievement tests. Instead, student achievement was assessed by means of the curriculum-embedded tests--pre- and post-tests over each of the objectives within the respective areas of study and pre- and post-tests over groups of objectives. In this manner student progress was measured in terms of their own performance rather than in terms of a comparison with a statistical norm.

Additional data, concerning students' attendance and discipline, were gathered from the files of the school.

Field test teachers administered the curriculum-embedded tests, which provided data in the area of academic achievement. Other data were collected by the field test evaluator.

FINDINGS

A first objective of the field test was to determine whether the curriculum system would work in the classrooms. Small pieces of the system had been tried in a few class periods, and there was therefore some tentative evidence that the system would work. The effort of the evaluation was focused initially on the question, Will students become involved in the learning activities designed by the curriculum writers?

Student Involvement

In writing the areas of study the staff assumed that students must

be involved in activities of some kind in order to master the objectives. Since the target population of the State's CVAE program are typically the uninvolved, it seemed imperative to verify that students would become involved in using the Region One system.

During 125 hours of observation in the field test classrooms, the evaluator collected data on the form OBSERVATION OF STUDENTS' CLASSROOM BEHAVIOR (see Figure 1). At intervals of three minutes, he counted the students who exhibited at that time the behaviors listed on the form. These counts were then converted to percentages, and throughout the period of the field test the staff studied the results for indications that the system should be modified.

Data collected on the form were reduced and analyzed, and the results are pictured in the graphs, Figures 2 through 7.

Social Studies. Figure 2 seems to indicate that student involvement began at a relatively high per cent (almost 60%) and rose gradually throughout the test period to around 80%. These high involvement rates seemed to result from students' participation in such activities as poster-making, drawing, model-construction, and collecting pictures from magazines.

Language Arts. Student involvement in the Language Arts activities also began at a high level for three of the four classes, as Figure 3 suggests. Student involvement levels were quite inconsistent over the period of the field test, as the zig-zag graphs indicate. Also, the boys (periods 1 and 2) were more consistently involved than the girls (periods 3 and 6). Isolated points on the graphs are quite high, with nine of the 26 points at

OBSERVATION OF STUDENTS' CLASSROOM BEHAVIOR

Circle one: 1 English Language Arts, 2 Mathematics, 3 Science, 4 Social Studies — Date: _____

Time: _____ to _____

Circle one: 1 Aide in class, 2 No aide in class — Observer: _____

Record at 3-minute intervals the number of all behaviors you observe.

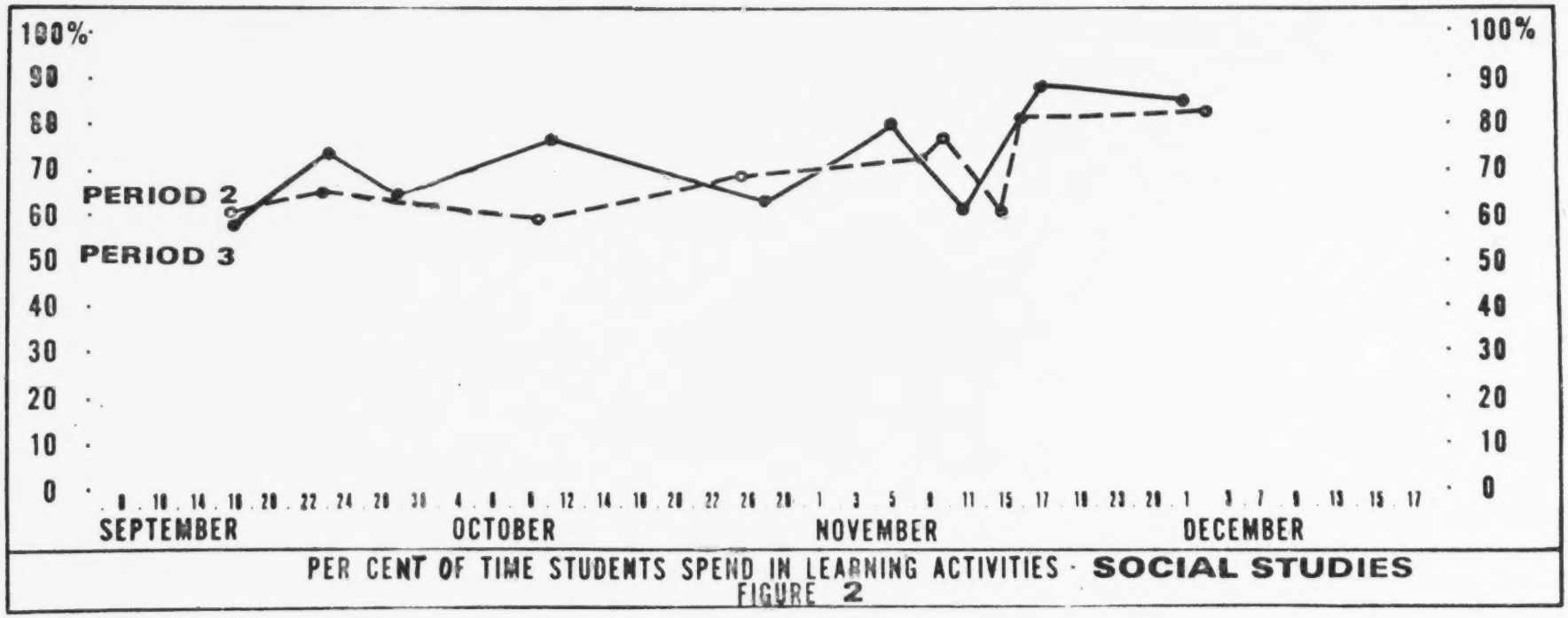
INDIVIDUAL WORK	1	2	3	4	5	6	7	8	9	10
1. Uses filmstrip/tape										
2. Uses worksheet/test										
3. Uses manipulative materials										
INTERACTIVE WORK										
1. Confers with Teacher/Aide										
2. Confers with other Student										
3. Observes other's work										
4. Receives group instruction										
NON-INSTRUCTIONAL ACTIVITY										
1. Gets materials										
2. Waits for Teacher/Aide										
3. Waits for Materials										
4. Loafs/Visits										
5. Disrupts										

Comments _____

(On the back write a brief narrative description of your observation.)

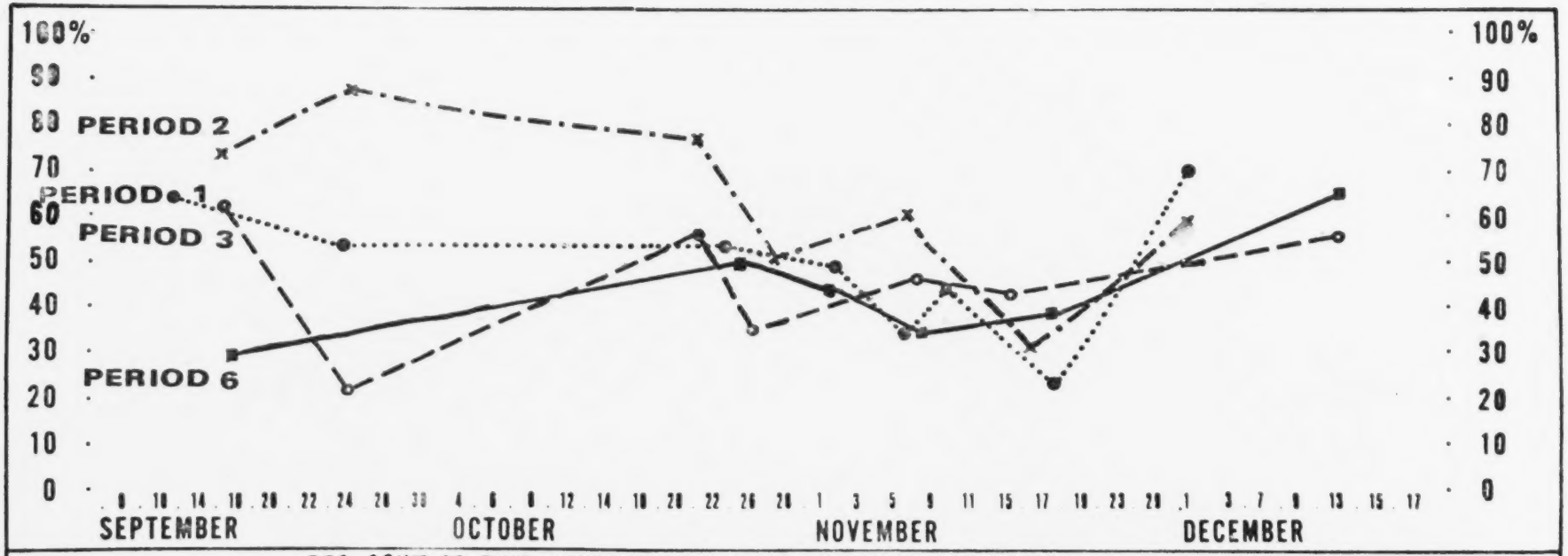
Form Used in Collecting Observation Data

Figure 1



PER CENT OF TIME STUDENTS SPEND IN LEARNING ACTIVITIES · **SOCIAL STUDIES**

FIGURE 2



PER CENT OF TIME STUDENTS SPEND IN LEARNING ACTIVITIES · **LANGUAGE ARTS**

FIGURE 3

or above 60%.

Math 8. Levels of student involvement for eighth grade Math are graphed in Figure 4. Except for period 2, there is a gradual increase indicated for September and October. On October 25 the teacher moved the girls in period 2 from tables to carrells, and for the next two observations, levels of involvement rose, then they dropped on the next three observations.

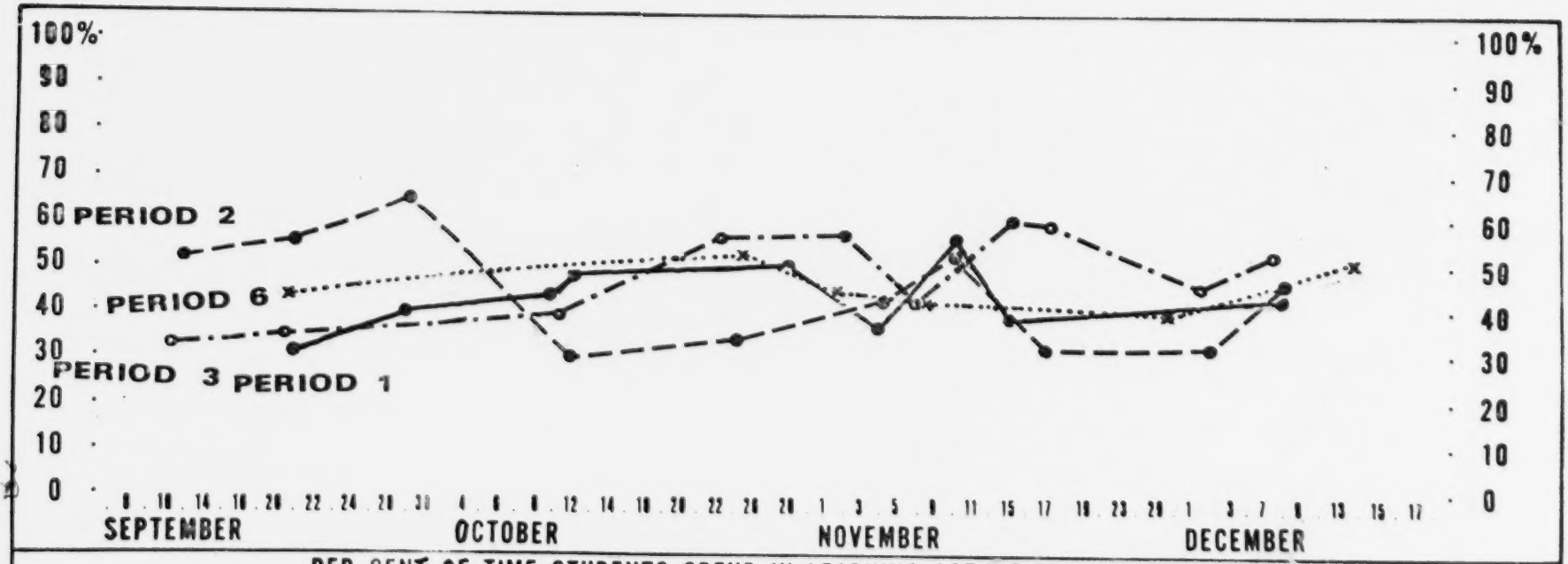
In all classes, levels of student involvement tended to decline after mid-November. It appears that this decline coincided with a decline in the use of manipulative materials.

Filmstrips and audio tapes were not available for use in the first area of study in Math, and those produced for the second area of study seem not to have been used very much. An apparent result was that students were dependent upon the teacher for individual instruction, and often students had to wait in line for help.

Math 9. In this analysis, Math 9 is considered separately from Math 8, not because the materials were different, but because the students were at a different "grade level."

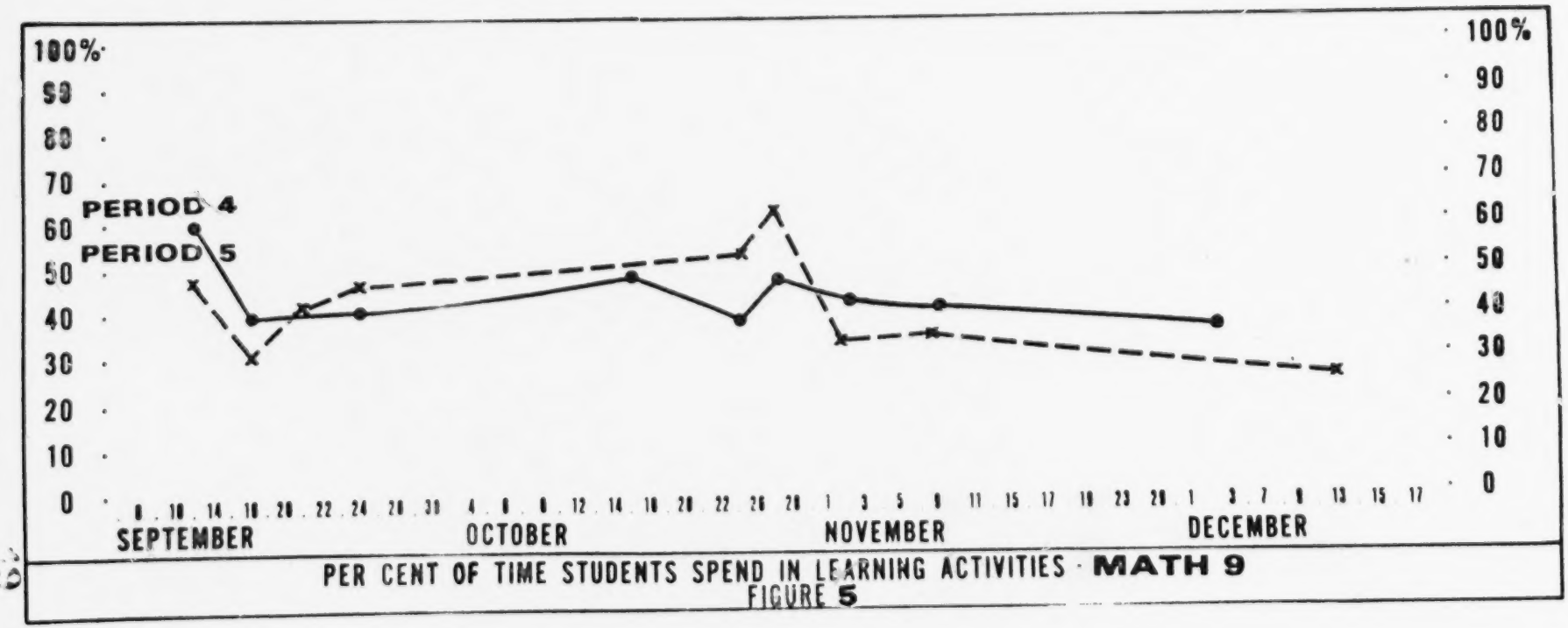
Figure 5 indicates that the rates of student involvement rose from mid-September through October, then tended to decline. Prior to September 16 the teachers had dispensed all materials used by the students; on that date students became responsible for the task. Teachers were thus freed to spend more time interacting with students.

(Comments in the Math 8 section above apply in general to the Math 9 program.)



PER CENT OF TIME STUDENTS SPEND IN LEARNING ACTIVITIES · **MATH 8**

FIGURE 4



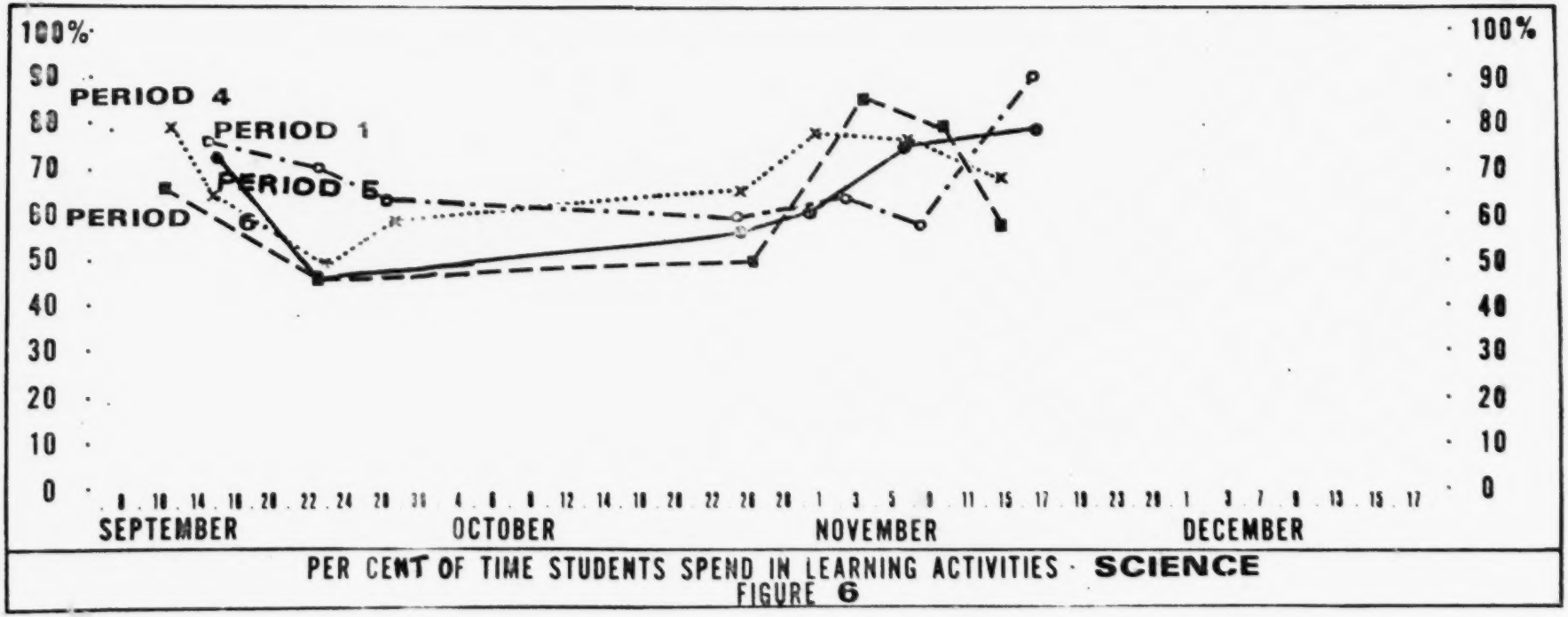
PER CENT OF TIME STUDENTS SPEND IN LEARNING ACTIVITIES · **MATH 9**

FIGURE 5

Science. From the first of the field test, students in the Science classes were responsible for getting their own materials. Also, most of the tapes and filmstrips were ready for the first part of the first area of study, and manipulative materials were ready for all parts of the program tested. As Figure 6 indicates, levels of student involvement were high at the beginning, fell sharply as filmstrips and tapes were exhausted, then rose sharply from late October, when a second area of study, with filmstrips and tapes, was implemented. With filmstrips and tapes available, the teacher did not have to spend so much time instructing one or two students, while other students were compelled to await their turn for instruction.

Summary of Student Involvement Rates. The bar graphs in Figure 7 display average (mean) percent of class time spent in the three main categories of student activity. These graphs reflect the fact that student involvement rates were considerably higher for social studies and science than for math and language arts. It was not possible to determine with certainty the factors involved in these differences, because so many variables were involved--teacher, curriculum area, type of learning activities, type of objectives.

Further, it should be noted that the time designated non-learning time includes some time in which students were waiting to confer with the teacher. Often these waiting students were observed to exchange ideas with each other while they waited. Also, the category includes time spent in getting and putting away materials and equipment, so that it can be



PER CENT OF TIME STUDENTS SPEND IN LEARNING ACTIVITIES · **SCIENCE**

FIGURE 6

argued that students were learning something (responsibility, for example), though they may not have been learning at that time one of the objectives of the area of study.

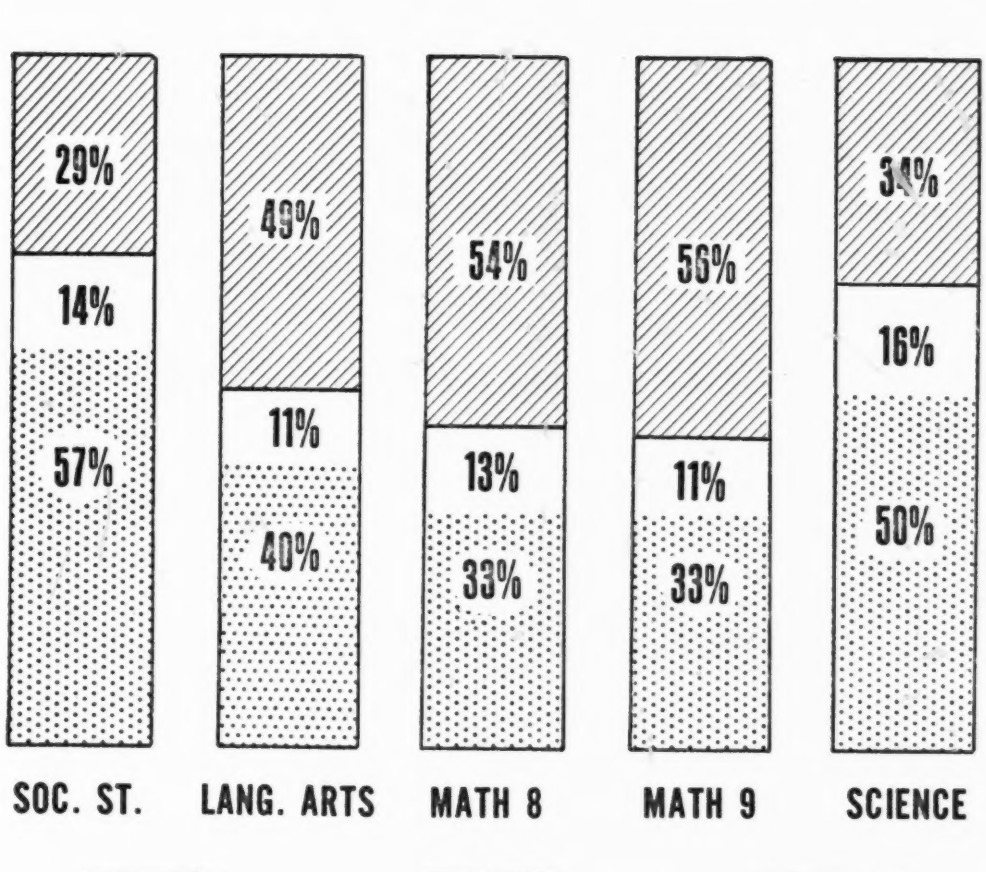
Taken at their face value, the percentages shown in Figure 7 reveal these trends in the field test classrooms: students in social studies were involved an average of 57% of their class time in the individualized learning activities designed by the curriculum writers, 14% of their class time interacting with each other or with the teacher, and 29% in non-learning activities (including the necessary activities of getting materials and waiting to confer with the teacher; see the list of categories in Figure 1).

In language arts they spent 40% of their time in individual learning activities, 11% in interactive activities, and 49% in non-learning activities.

In eighth grade math the percentages in these three categories were, respectively, 33%, 13% and 54%, and the percentages in ninth grade math, where two CVAE units met together in the same room with two teachers, were 33%, 11% and 56%.

Science students, all of them in the ninth grade, were engaged 50% of their class time in individual activities, 16% in the interactive category, and 34% in the non-learning category.

It is likely that a majority of the CVAE students in the field test had been almost completely passive in the classes in which they had been previously enrolled. Their involvement in this new program, from 44% to 71% of their class time (that is, the sum of individual and



AVERAGE PERCENT OF CLASS TIME SPENT IN 3 TYPES OF ACTIVITIES

FIGURE 7

interactive categories), probably indicates a tremendous increase in involvement time for many of these students.

Throughout the period of the field test the evaluator observed that there were in most of the classes two or three students who accounted for a large percentage of the time accumulated in the Loafs/Visits category.

Individualization of Instruction

A number of considerations dictated that the Region One Curriculum System for CVAE academic subjects should be individualized. Students in the CVAE program are selected from among those whose work is below grade level, but in any class students will be working at many different levels and at many different rates. It is also true that students enrolling late may have a difficult time "catching up" if they are not allowed to begin at the beginning and to work at their own rate. And while it is hoped that the CVAE program will eventually reduce absence rates, it is nevertheless true that the student who is absent will find it easier to resume work at the point where he himself left off than to resume work at the point to which a class has moved during his absence.

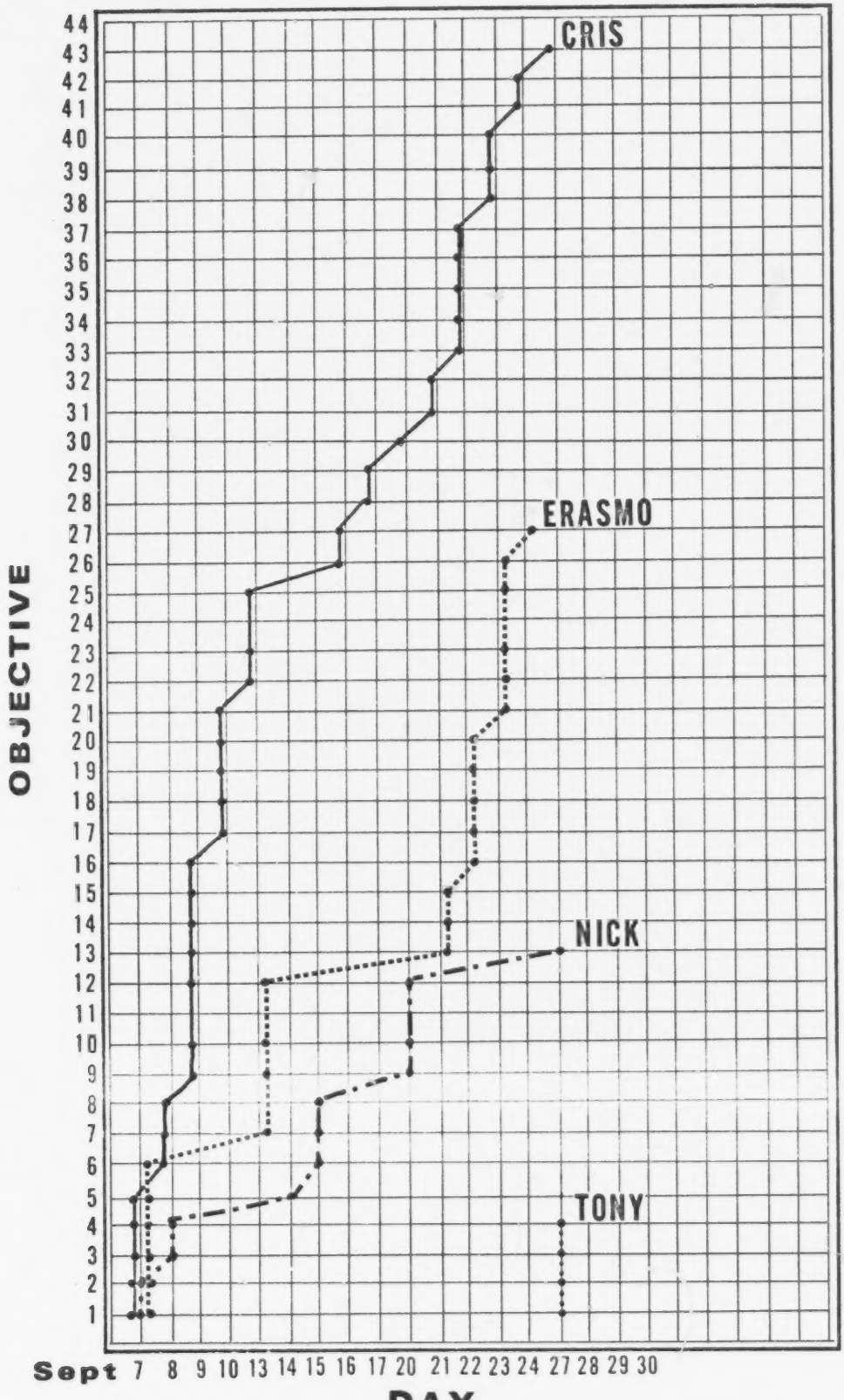
It was therefore essential to determine whether the system did indeed provide individualized instruction, and whether late enrollees and absentees were able to benefit from such a program. In each of the curriculum areas, therefore, the staff collected data which would compare the progress rates of individuals in a given class. From time to time some of these data were plotted so that graphical comparisons could be

made. One such comparison is presented in Figure 8. The graphs indicate that Cris worked at a rate considerably faster than the others. She completed objectives one through five on September 7, six through eight on September 8, nine through sixteen on September 9, and so on. By September 27 she had completed forty-three objectives. During the same time Erasmo completed only twenty-seven, but as the horizontal plateaus on his graph indicate, he was absent for several days on two different occasions. Nick's attendance record was also poor, so his graph, which is flatter than the others, indicates a slower rate of mastery of the objectives. By September 27 he had completed only thirteen objectives. Finally, Tony, who enrolled on September 27, completed the first four objectives on that day.

These four students were selected out of a class to illustrate the diversity of progress rates. Had data for each of the remaining members of the class been plotted on the same set of axes, the result would be a fan-shaped set of graphs, falling generally between those of Cris and Nick in Figure 8. These graphs show that individual progress is not hampered by the progress of others in the class, that absentees can continue to make progress upon their return to class, and that late enrollees can also make progress in spite of their late enrollment.

Attendance

School files afforded a comparison of absence rates for CVAE students. The summary of attendance data, presented in Table 1, compares data for the entire 1970-71 school year with only the first semester of



Rate of Progress for Four Math 9 Students

Figure 8

the 1971-72 year. It is therefore likely that comparisons for complete years would be somewhat different. The available data, however, show a decline in absence rate from 9.1% to 8.0% for eighth grade CVAE students, and 8.8% to 7.8% for ninth grade (see line 6, Table 1).

Of the students in the eighth grade, thirty-four students had better attendance records during the field test than they had the previous school year, and twenty had worse records. While the difference between the number with better records and those with worse records is substantial, it is not statistically significant ($.05 < p < .10$). The same kind of comparison for ninth grade students was significant, however, as forty-three had better attendance records, and only fourteen worse records ($p < .001$).

Discipline

Tables 2 and 3 present, respectively, a summary of data from the school files and a summary of the assistant principal's judgment concerning CVAE students' behavior patterns (the assistant principal in the field test school had major responsibility in the area of discipline). Again, the data must be interpreted in view of the fact that the first semester of the 1971-72 school year is compared with data for the entire 1970-71 year.

Table 2 shows that the percent of disciplinary referrals which were CVAE students dropped from 28.4% of the school total to 11.7%. The trend toward improved discipline among CVAE students was substantiated by the assistant principal's judgment. Table 3 shows that in his

TABLE 1
SUMMARY OF ATTENDANCE DATA

	PRESENT EIGHTH GRADE		PRESENT NINTH GRADE	
	70-71	71-72*	70-71	71-72*
1. Number of students	56	56	58	58
2. Total number of student days present	8245	4206	8489	4182
3. Total number of student days absent	822	367	815	353
4. Total number of student days (sum lines 2 & 3)	9067	4573	9304	4535
5. % student days present	90.9	92.0	91.2	92.2
6. % student days absent	9.1	8.0	8.8	7.8
7. Mean number days present per student	147.2	75.1	146.4	72.1
8. Mean number days absent per student	14.7	6.6	14.0	6.1

* All 71-72 figures are for the first semester only, as compared with 70-71 figures for the entire year.

TABLE 2
SUMMARY OF DISCIPLINE DATA

	70-71	71-72*
1. Number of disciplinary referrals	402	145
2. Number of CVAE student referrals	114	17
3. % referrals which are CVAE students	28.4%	11.7%

* Data for 71-72 is for the first semester only, while data for 70-71 is for the entire school year.

TABLE 3
ASSISTANT PRINCIPAL"S JUDGMENT:
CHANGE IN BEHAVIOR PATTERN

	8th	9th	Total
1. Change for the better	8	13	21*
2. Change for the worse	7	2	9*

* The number of students whose behavior has changed for the better differs significantly from the number of those which has changed for the worse (McNemar's change statistic, p less than .05)

TABLE 4
MEAN SCORES OF EIGHTH AND NINTH GRADE STUDENTS ON TWO
MEASURES OF ATTITUDE -- PRE- AND POST-TEST

		EIGHTH GRADE		NINTH GRADE	
		Pre n=47	Post n=58	Pre n=45	Post n=52
Attitude Toward School	mean	7.8	7.2	7.1	6.2
	s.d.	2.4	2.3	2.7	2.6
Self-Concept of School Ability	mean	6.5	6.3	6.0	6.2
	s.d.	2.2	2.4	2.8	2.1

judgment twenty-one CVAE students changed for the better during the field test year, while nine changed for the worse--a difference statistically significant at the .05 level.

Student Attitudes

An effort was made to measure students' attitude toward school and their self concept of school ability, using items from The International Objectives Exchange.[3] A short questionnaire was developed and was administered orally both at the beginning and the conclusion of the field test period. It appears, however, that pre-test scores were inflated, because participating students had been told that they were to take part in a new program which they would really like and which would be a departure from their previous school experience. As was therefore expected, and as Table 4 indicates, pre- and post-test scores on these measures were not significantly different.

A subject preference list was also administered orally, both at the beginning and the end of the field test period. A comparison of the pre- and post-tests shows that a significant number of ninth grade students changed from a dislike for science to an expressed liking for it, while they were changing in the opposite direction--that is, from a liking to a dislike--for language arts. These students were enrolled in the Region

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[3] Attitude Toward School K-12; Measures of Self Concept K-12. Available from The Instructional Objectives Exchange, P. O. Box 24095, Los Angeles, California 90024.

One program for science, but in a more traditional program for language arts. However, any interpretation of these data must be made with the understanding that many other uncontrolled variables were involved in the classroom situation.

Eighth grade students, who were not enrolled in science, made no change in their expressed preferences for science. This fact lends some credence to the conclusion that the positive change of ninth grade students was a bona fide shift (see Table 5).

Academic Achievement

While the field test was not designed primarily to determine levels of student achievement, it did provide data which indicate tentative and general conclusions concerning what CVAE students learned during the first semester, 1971-72.

It was clear from the outset of the project that standardized tests were not appropriate instruments for measuring student learning, because the learning activities, pre- and post-tests on individual objectives, and more general pre- and post-tests were all criterion-referenced. These tests were all developed along with the other components of the system so that they would be embedded in the curriculum itself.

Data from these tests were analyzed, and findings are presented in this section of the report.

Mathematics. Two areas of study were tested in two ninth grade and four eighth grade math classes. A single teacher directed students in

TABLE 5
NUMBER OF STUDENTS MAKING CHANGES
IN SUBJECT PREFERENCES

	EIGHTH GRADE n=46		NINTH GRADE n=40	
	Pos	Neg	Pos	Neg
ENGLISH LANGUAGE ARTS	7	12	0	11*
MATHEMATICS	0	5	8	8
SOCIAL STUDIES -- Total	8	10	7	11
Students enrolled in Social Studies	5	5	--	--
Students enrolled in Occupational Orientation	3	5	--	--
ART	4	7	7	7
MUSIC	11	7	9	10
VOCATIONAL COURSE -- Total	8	6	4	4
Commercial Decoration & Display	2	2	0	1
Construction Trades	3	1	1	0
Horticulture	2	2	3	2
General Mechanics	1	1	0	1
SCIENCE	11	10	12	2**
PHYSICAL EDUCATION	14	8	6	5

* Difference between number of positive and negative changes is significant, p less than .01.

** Difference between number of positive and negative changes is significant, p less than .02.

the eighth grade classes, while two teachers directed students in double units of CVAE students in the ninth grade.

Numeration, consisting of 45 objectives, is the first area of study in the math curriculum. No general pre-test was given, but a general post-test was administered when the student completed the area of study. Those students who did not complete the area of study took the general post-test at the end of the semester.

Eleven of the 45 objectives were eliminated from the analysis because pre- and post-tests were oral, or because it was difficult to test the individual item on a general post-test (objectives not included are numbers 7, 8, 10, 11, 19, 22, 24, 32, 34, 42, 43; see objectives list in the Appendix).

Table 6 summarizes the data for grades eight and nine and presents the data combined for the two grade levels. Line 7 of the Numeration column indicates that 2112 individual pre-tests were passed--that is, 78.0% of them. From classroom observation, it appears that this number is inflated, as students were observed to give and receive help from each other on some of the pre-tests. It is also likely that some of the pre-tests were invalid.

Of the 2112 individual pre-tests passed initially, only 1288 were passed a short time later on the general post-test (lines 7 and 11, Table 6). It is not easy to explain how more than one-third of the objectives actually mastered at some time previous to the pre-test could have been lost so soon. It therefore seems evident that the pre-test mastery was more apparent than real.

It should also be noted that the Numeration area of study, during the field test, was not spread over parts of three school years, as was planned in the writing of it. Hence, no provision was made for maintenance of skills. This fact probably accounts for some of the loss of mastery.

Line 11 of Table 6, reveals that 1288 of the 2709 individual objectives were mastered (47.5%) on the general post-test. A more significant finding, perhaps, is that of the 597 individual objectives initially failed, 189 of them were passed on the general post-test. That is, 31.7% of the objectives not previously mastered were retained by these CVAE students, at least on a short-term basis.

The area of study Addition, Part I, was also tested, and a summary of results for ninth grade students only is shown in the second column of Table 6. As would be expected, an even greater number of individual pre-tests were passed, as line 7 reveals, and students taking the overall post-test demonstrated that they retained 60.6% of the new materials that they had learned (line 12, Table 6).

Two factors seemed to have contributed substantially to the disparity in gains in the two areas of study: (1) only ninth grade students' data are analyzed in the Addition area of study, whereas about half the Numeration data were from eighth grade students; (2) a greater number of unfamiliar mathematical concepts were introduced in the Numeration than in the Addition area of study.

At the end of the spring semester (that is, more than an entire semester after the students had completed the areas of study discussed

TABLE 6

ACHIEVEMENT IN MATHEMATICS

1.	Area of study	Numeration	Addition, Part I
2.	Number of objectives in area	45	30
3.	Number of objectives in analysis	34	20
4.	Number of students in analysis	95	38
5.	Grade level	8 & 9	9
6.	Number of data points analyzed [a]	2709	701
7.	Individual pre-tests passed	2112 (78.0%)	668 (95.3%)
8.	Individual pre-tests failed but corresponding post-test subsequently passed [b]	592 (21.8%)	32 (4.6%)
9.	Objectives mastered (sum of 7 and 8)	2704 (99.8%)	700 (99.9%)
10.	Failed pre-tests whose corresponding post-tests were subsequently passed [c]	592 of 597 (99.2%)	32 of 33 (97.0%)
11.	Items on general post-test passed	1288 (47.5%)	529 (75.5%)
12.	Failed pre-tests whose corresponding items on general post-test were passed	189 of 597 (31.7%)	20 of 33 (60.6%)

[a] A data point consists of a Pass or Fail on one student's pre-test and post-test for a single objective, together with a Pass or Fail on the corresponding item on the general post-test.

[b] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Total number of data points}}$

[c] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Number of individual pre-tests failed}}$

above), an additional test was given. Five items were selected from each of the four curriculum areas for inclusion on the test, and the items selected were those which the greatest number of students had initially failed but had subsequently mastered. In math the items tested students' retention of objectives 25, 26, 27 and 37 in Numeration, and objective 12 in Addition (see the list of objectives in the Appendix). Eighth and ninth grade students retained 22% and 33% of those objectives respectively.

It is instructive to observe, however, that three of those five objectives were (in the field test edition) quite theoretical and even esoteric (prime numbers, composite numbers, repeating decimals), while the other two were relevant to the needs of CVAE students (changing fractions to lowest terms, and adding fractions). For eighth grade students, the retention rates of these latter two items was 45%, while that for the former three was less than 4%. Similarly, for ninth grade students, the retention rate for the latter two was 76%, while that for the former three was 8%.

These figures are to be interpreted with caution, for the data are scant. Two conclusions do seem tenable: (1) it is possible, through the use of delayed testing, to obtain additional supportive evidence concerning the appropriateness of specific objectives; (2) it is possible to show that CVAE students using the Region One system do retain mastery over a significant portion of the specific learning objectives.

Science. The two areas of study used in the science curriculum field test were Measurement and Magnetism and Electricity. These areas of study were used in four ninth grade classes of CVAE students.

Summaries of the data collected in these areas are presented in Table 7. Line 7 of Table 7 shows that 91.8% of the pre-tests in the Measurement area were passed, and 67.1% of those in Magnetism and Electricity.

From the evaluator's classroom observations it is clear that these figures are inflated by two factors: (1) some students' misuse of pre-tests; (2) a lack of validity of some of the pre-tests.

Students were observed to misuse pre-tests in the following way: they would take a copy of the pre-test, a filmstrip, and the appropriate realia, go to a table, and then manipulate the materials in a trial-and-error fashion to produce reasonable "answers" on the pre-test. In so doing they appeared to demonstrate mastery over the objective, when in fact they had not achieved mastery. They then would pass to the next objective without having participated in the learning activities. When they faced general post-test items corresponding to those objectives, they were not able to correctly answer many of them (compare line 11 of Table 7 with line 7).

There is evidence that the ninth grade students in the field test were more familiar with the concepts in Measurement than those in Magnetism and Electricity (see line 8 of Table 7). In both areas they eventually demonstrated mastery over almost all the objectives (lines 9 and 10). Their short-term retention rates were also substantial (lines 11 and 12).

On the delayed overall test of five items, administered to these ninth grade CVAE students after an intervening semester, the retention rate was 46%. As was true for math, the objectives selected for this test were those which the greatest number of students had initially failed but had

TABLE 7
ACHIEVEMENT IN SCIENCE

	Measurement	Magnetism & Electricity
1. Area of study		
2. Number of objectives in area	31	26
3. Number of objectives in analysis	19	20
4. Number of students in analysis	48	41
5. Grade level	9	9
6. Number of data points analyzed [a]	766	702
7. Individual pre-tests passed	703 (91.8%)	471 (67.1%)
8. Individual pre-tests failed but corresponding post-test subsequently passed [b]	63 (8.2%)	224 (31.9%)
9. Objectives mastered (sum of 7 and 8)	766 (100.0%)	695 (99.0%)
10. Failed pre-tests whose corresponding post-tests were subsequently passed [c]	63 of 63 (100.0%)	224 of 231 (97.0%)
11. Items on general post-test passed	537 (70.1%)	410 (58.4%)
12. Failed pre-tests whose corresponding items on general post-test were passed	49 of 63 (77.8%)	132 of 231 (57.1%)

[a] A data point consists of a Pass or Fail on one student's pre-test and post-test for a single objective, together with a Pass or Fail on the corresponding item on the general post-test.

[b] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Total number of data points}}$

[c] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Number of individual pre-tests failed}}$

subsequently passed (Measurement objectives 6 and 9, and Magnetism and Electricity objectives 11, 16 and 19; see objectives list in the Appendix).

These same items were given to the eighth grade students, who had not participated in the science curriculum. Their responses were correct 19% of the time, mostly on the two Measurement items (31% and 41%, respectively), which required only arithmetic ability. On the other three items, eighth grade responses were correct only 3%, 21% and 0% of the time. This finding seems to indicate that the ninth grade science students did in fact retain mastery over almost half of those objectives which they found most challenging.

Language Arts. Only one area of study, Word Recognition, was field tested in the language arts curriculum, and the data are summarized in Table 8. Although 78.5% of the individual pre-tests were passed (line 7, Table 8), students nevertheless participated in the learning activities. An additional 18.5% then demonstrated mastery over the objectives (line 8), making a total of 97.0% mastery (line 9).

It is further observed that 89.3% of the objectives failed on the pre-test were subsequently passed (line 10), and that on the overall post-test, 75.3% of the items were passed. More significant, perhaps, is the fact that 77.4% of the objectives initially failed on the individual pre-tests were passed on the general post-test at the end of the semester (line 12 of Table 8).

On the delayed post-test of five items (as in the other curriculum areas, these five items were those the students found most challenging), eighth grade students demonstrated mastery over 62% of them. However,

TABLE 8
ACHIEVEMENT IN LANGUAGE ARTS

1.	Area of Study	Word Recognition
2.	Number of objectives in area	56
3.	Number of objectives in analysis	40
4.	Number of students in analysis	57
5.	Grade level	8
6.	Number of data points analyzed [a]	1216
7.	Individual pre-tests passed	954 (78.5%)
8.	Individual pre-tests failed but corresponding post-test subsequently passed [b]	225 (18.5%)
9.	Objectives mastered (sum of 7 and 8)	1179 (97.0%)
10.	Failed pre-tests whose corresponding post-tests were subsequently passed [c]	225 of 252 (89.3%)
11.	Items on general post-test passed	916 (75.3%)
12.	Failed pre-tests whose corresponding items on general post-test were passed	195 of 252 (77.4%)

[a] A data point consists of a Pass or Fail on one student's pre-test and post-test for a single objective, together with a Pass or Fail on the corresponding item on the general post-test.

[b] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Total number of data points}}$

[c] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Number of individual pre-tests failed}}$

ninth grade students, who did not participate in the Region One language arts program, did equally well, answering 63% of the items correctly.

At a second site, Mission Junior High School, the same area of study was tested in five classes. Different achievement data, however, were collected. The first sixty-six items of the Prescriptive Reading Test, Texas Developmental Edition, were administered both at the beginning and at the end of the semester in which the Region One system was used. In addition, an oral test, with items taken from the specific objectives, was administered. Results of these pre- and post-test comparisons are presented in Tables 9 and 10. Table 9 shows that students made significant gains on both the Phonic Analysis and the Translation sections of the test. There was also a gain on the Structural Analysis section, but the gain was not statistically significant.

The teacher at this second site used other materials in addition to the Region One system. She interspersed work in the Word Recognition area of study with high interest-low reading level materials. It is therefore impossible to determine what part of the gains in achievement are attributable to the Region One system.

Table 10 reveals that for nine of the thirty-one objectives tested orally there were significant numbers of students making gains (.05 level or beyond). It therefore appears that the Word Recognition area of study made an appreciable contribution to students' word attack skills, but just how great a contribution cannot be determined from the available data.

TABLE 9

PRE- AND POST-TEST COMPARISON OF THREE SECTIONS OF THE PRESCRIPTIVE READING TEST, TEXAS DEVELOPMENTAL EDITION

	PRE-TEST (n=78)	POST-TEST (n=54)
Phonic Analysis*	mean 11.68 s.d. 4.74	mean 14.06 s.d. 4.50
Structural Analysis	mean 10.47 s.d. 4.58	mean 11.57 s.d. 5.13
Translation*	mean 5.05 s.d. 2.68	mean 5.78 s.d. 2.81

*Difference of means significant at .01 level.

TABLE 10

Number of Changes in Responses
to Items on the Oral Test

Objective	Incorrect-to-Correct	Correct-to-Incorrect
4	11	6
5	3	2
6	5	1
8*	24	7
10	14	5
11*	10	1
12	9	18
13	9	7
14*	10	2
16	5	2
17	7	1
19	16	6
20	7	5
22	7	2
23	8	3
24	10	4
25	16	10
27	13	7
30*	35	11
36	4	0
37*	12	3
38	7	3
39	10	4
41*	13	2
42*	14	2
43	5	1
44	9	5
46	12	8
48	2	2
49*	7	0
50*	13	1

*Number of changes significant at .05 level or beyond, McNemar's significance of change statistic.

Social Studies. The content of the social studies curriculum departs from the traditional limitation to history and geography. It was therefore decided to field test parts of three areas of study--Culture, Americanism and Humanity. In its test version, the social studies curriculum differed from the other curricular components in that the pre-tests were designed to focus students' attention on the learning activities to follow, rather than to assess their mastery of a given objective. Post-tests, on the other hand, were designed to assess mastery. (Pre-tests have since been revised to make them comparable to the post-tests.)

In order to make data summaries comparable to those in the other three curriculum areas, lines 7, 8, 10 and 12 had to be omitted from Table 11. The table does show, however, that achievement in social studies is indicated by the fact that students demonstrated mastery over 83.0% of the objectives in the Culture area, 88.0% of those in Americanism, and 93.2% of those in Humanity (see Table 11, line 9). On a general post-test, these students answered correctly 89.7%, 43.4% and 77.3% of the items, respectively (Table 11, line 12).

On the delayed post-test, using the five items which students found most challenging, eighth grade students correctly answered 26% of the items, while ninth grade students answered correctly 30% of them. However, only half the eighth grade students participated in the Region One curriculum in social studies, while the other half participated in the Occupational Orientation program at their school. When the eighth grade CVAE students who were enrolled in the Region One program are

TABLE 11
ACHIEVEMENT IN SOCIAL STUDIES

	Area of study	Culture	Americanism	Humanity
2.	Number of objectives in area	24	33	40
3.	Number of objectives in analysis	7	9	11
4.	Number of students in analysis	26	25	26
5.	Grade level	8	8	8
6.	Number of data points analyzed [a]	106	166	163
7.	Individual pre-tests passed	-	-	-
8.	Individual pre-tests failed but corresponding post-test subsequently passed [b]	-	-	-
9.	Objectives mastered (sum of 7 and 8)	88 (83.0%)	146 (88.0%)	152 (93.2%)
10.	Failed pre-tests whose corresponding post-tests were subsequently passed [c]	-	-	-
11.	Items on general post-test passed	95 (89.7%)	72 (43.4%)	126 (77.3%)
12.	Failed pre-tests whose corresponding items on general post-test were passed	-	-	-

[a] A data point consists of a Pass or Fail on one student's pre-test and post-test for a single objective, together with a Pass or Fail on the corresponding item on the general post-test.

[b] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Total number of data points}}$

[c] Ratio: $\frac{\text{Number of individual pre-tests failed, post-test passed}}{\text{Number of individual pre-tests failed}}$

separated from others, it is found that they answered correctly 33%, the others only 19%. In other words, the three groups of students ranked as follows:

1. Eighth grade enrolled in social studies, 33%
2. Ninth grade not enrolled in social studies, 30%
3. Eighth grade not enrolled in social studies, 19%.

It should be noted that the format of the delayed post-test was not conducive to the best performance on the part of CVAE students: it was too lengthy (five letter-size pages), questions were strictly paper-and-pencil questions--the kind of exercise to be avoided with students who have become disenchanted with formal schooling. It is therefore probable that the figures reported above are underestimates of student achievement.

Summary of Findings

A summary of field test results is presented in Table 12. The first two lines of the table show that the rate of absenteeism dropped from 8.9% to 7.9%, and that the rate of CVAE disciplinary referrals dropped from 28.4% to 11.7%. In addition, ninth grade students expressed a significant change in their attitude toward science and toward language arts: they expressed a greater liking for science, in which they were enrolled in the Region One program; they expressed a greater dislike for language arts, in which they were enrolled in a more traditional program (line 3, Table 12).

Individualization of the learning process is illustrated by the fact that students spent from 33% to 57% of their class time in individual activities (line 4, Table 12). Students also spent from 11% to 16% of their class time interacting with the teacher or with their peers (line 5, Table 12). These two sets of figures summed indicate that students who had a history of passiveness in the classroom became actively involved in the designed learning activities from 45% to 71% of the time.

Students demonstrated mastery of the specific performance objectives, from 88.7% to 99.8% in the different curriculum areas (line 8, Table 12). More significantly, they demonstrated short-term retention rates which varied from 33.2% to 77.4% in the different curriculum areas (line 11, Table 12).

CONCLUSIONS AND RECOMMENDATIONS

In view of the field test results reported above, the following conclusions and recommendations are given.

Conclusions

1. The Region One CVAE Academic Curriculum System is viable, as it provides a non-traditional program at a level where CVAE students can succeed.

2. CVAE students do actively participate in the learning process as they proceed individually through the program. They do not remain passive, as they generally do in a traditional classroom.

TABLE 12

REGION ONE CVAE CURRICULUM SYSTEM
SUMMARY OF FIELD TEST RESULTS

1. Percent of school days students were absent dropped from 8.9% for 1970-71 to 7.9% for the first semester of 1971-72.

2. Percent of disciplinary referrals which were CVAE students dropped from 28.4% for 1970-71 to 11.7% for the first semester of 1971-72.

3. After one semester, ninth grade students' expressed liking for science increased significantly, while their liking for Language Arts decreased significantly. Note: these students were enrolled in the Region One Science program but not in the Region One Language Arts program.

	SCIENCE	MATH	LANGUAGE ARTS	SOCIAL STUDIES
4. Percent of time students were involved in individual learning activities	50	33	40	57
5. Percent of time students were involved in interactive learning activities	16	12	11	14
6. Percent of objectives whose pre-tests were passed	80.0	81.5	78.5	*
7. Percent of objectives whose pre-tests were failed but corresponding post-test subsequently passed	19.6	18.3	18.5	*
8. Percent of objectives mastered (sum. of 6 and 7)	99.6	99.8	97.0	88.7
9. Percent of failed pre-tests whose corresponding post-tests were subsequently passed	97.6	99.0	89.3	*
10. Percent of items passed on general post-test	64.5	53.3	75.3	67.4
11. Percent of objectives whose pre-tests were failed but corresponding items on overall post-test passed	61.6	33.2	77.4	*

*Data were not available.

3. Individualization of instruction is accomplished, making possible continuous progress by CVAE students, even by those who enroll late and those who return from absences.

4. More positive student attitudes and mastery of performance objectives are demonstrable.

Recommendations

1. Additional areas of study should be completed, to constitute a three-year program for junior high school CVAE students.

2. A model for the training of CVAE teachers in the rationale, format, and use of the Region One System should be developed and tested, with a view to possible statewide duplication.

3. There should be an increased production of additional copies of the completed areas of study so that interested schools in Region One can begin using the program during the school year 1972-73.

4. Classroom testing of areas of study, as they are completed, should continue, so that revisions of materials may be based upon empirical evidence.

5. Additional affective and achievement data should be collected and analyzed. The data should be collected in at least two different school districts so that the generalizability of any findings might be possible.

APPENDIX
PROPOSED AREAS OF STUDY

SCIENCE

1. Measurement
2. Magnetism and Electricity
3. Machines
4. Waste Use and Disposal-Pollution
5. Water
6. Alcohol, Tobacco, Drugs
7. Understanding the Earth
8. Environment
9. Weather
10. Ecology
11. Plants and Animals
12. Health

SOCIAL STUDIES

1. Time
2. Propaganda
3. Americanism
4. Religion-Ethics
5. Freedom and Responsibility
6. Consumer
7. World
8. Law and Justice
9. Culture
10. Democracy vs. Communism
11. Today
12. Humanity
13. Work
14. History
15. Politics

MATH

1. Numeration
2. Addition
3. Subtraction
4. Multiplication
5. Division
6. Combination of Processes
7. Time
8. System of Measurement
9. Geometry
10. Consumer Education

READING - LANGUAGE ARTS

1. Word Recognition
2. Reading Skills
3. Reading Comprehension
4. Vocabulary
5. Oral Communication
6. Written Communication
7. Mechanics
8. Functional Grammar
9. References
10. The Sentence
11. Social Living
12. Communication and Entertainment Today
13. Knowing Yourself
14. Literature

OBJECTIVES: CVAE MATH (Numeration)

1. The student will be able to count to 1,000.
2. The student will be able to express whole numbers in the expanded form.
3. The student will be able to spell the name of each of the numerals from zero through twenty.
4. The student will identify the value of the zero, according to its position in the numeral.
5. The student will be able to abbreviate the ordinal numbers, first through the thirty-first.
6. The student will be able to distinguish between even and odd numbers.
7. The student will be able to classify each given common fraction as proper or improper.
8. The student will be able to break the number one into different fractional parts.
9. The student will be able to show the relationship between positive and negative numbers in the number line.
10. The student will be able to show the relationship between positive and negative fractions in the number line.
11. The student will be able to show that the real numbers is the union of positive and negative integers and fractions plus the place holder (zero).
12. The student will be able to convert a common fraction, in tenths, into its decimal form.
13. The student will be able to convert a decimal fraction, in tenths, into its common fractional form.
14. The student will be able to convert a common fraction, in hundredths, into its decimal form.
15. The student will be able to convert a decimal fraction, in hundredths, into its common fractional form.

16. The student will be able to convert common fractions with one or two digit denominators into its decimal form.

17. The student will be able to convert a decimal fraction in the tenths or hundredths into their common fractional form.

18. The student will be able to identify the Roman numerals I through XII.

19. The student will be able to orally express numbers between zero and one million.

20. The student will be able to spell the name of each number from zero through one hundred.

21. The student will be able to apply the property of zero with respect to addition.

22. The student will be able to apply the property of zero with respect to subtraction.

23. The student will be able to apply the property of zero with respect to multiplication.

24. The student will be able to apply the rule of zero as a divisor.

25. The student will be able to list the prime numbers less than fifty.

26. The student will be able to state the property of composite numbers.

27. The student will be able to reduce a reducible fraction to its lowest fractional form.

28. The student will be able to define rational numbers.

29. The student will be able to define irrational numbers.

30. The student will be able to express numbers in powers of ten notation.

31. The student will be able to express products of like factors in exponential form.

32. The student will be able to orally express numbers between zero and one billion.

33. The student will be able to spell the name of each number from zero through one billion.

34. The student will be able to recall in brief, the history of zero.

35. The student will be able to spell each ordinal number (1st, 2nd, 3rd, 4th,....) between first and thirty-first inclusive.

36. The student will be able to express decimal fractions which contain repetitive parts.

37. The student will be able to correctly convert decimal fractions which contain only repetitive parts into common fractions.

38. The student will be able to correctly convert decimal fractions which contain both repetitive and non-repetitive parts into common fractions.

39. The student will be able to express any given number as powers of ten (scientific notation).

40. The student will be able to express any given number as factors with exponents.

41. The student will be able to identify sets.

42. The student will be able to apply set theory in solving problems involving two sets.

43. The student will be able to classify the different types of sets.

44. The student will be able to use the union and intersection properties of sets in problem solving.

45. The student will be able to solve set problems which involve subsets, improper subsets, proper subsets, and null sets.

OBJECTIVES: CVAE MATHEMATICS (Addition, Part I)

1. The student will learn how to use the addition table for whole numbers.

2. The student will be able to solve addition problems which contain two one-digit addends and two-digit sums.

3. The student will be able to solve addition problems which contain two two-digit addends and two-digit sums.

4. The student will be able to solve addition problems which contatin two two-digit addends and two-digit or three-digit sums.

5. The student will be able to solve addition problems which contain three two-digit addends.

6. The student will be able to solve addition problems which contain three one-digit and two-digit addends.

7. The student will be able to solve addition problems which contain two to six one-digit to five-digit addends.

8. The student will be able to express whole number addends, addition problems in story form.

9. The student will be able to interpret and solve whole number addends story problems.

10. The student will be able to solve addition problems which contain two common fractions with like denominators.

11. The student will be able to solve addition problems which contain two or more common fractions with like denominators.

12. The student will be able to solve addition problems which contain two or more common fractions with unlike denominators.

13. The student will be able to solve addition problems which contain two or more common fractions with unlike denominators.

14. The student will be able to express addition problems of fractions in story form.

15. The student will be able to interpret and solve story addition problems with fractions as addends.

16. The student will be able to solve addition problems which contain two mixed number addends with fractions of like denominators.

17. The student will be able to solve addition problems which contain two or more mixed number addends with fractions of like denominators.

18. The student will be able to solve addition problems which contain two mixed number addends with fractions of unlike denominators.

19. The student will be able to solve addition problems which contain two or more mixed number addends with fractions of unlike denominators.

20. The student will be able to express in story form, addition problems which contain mixed numbers as addends.

21. The student will be able to interpret and solve written addition problems which contain mixed numbers as addends.

22. The student will be able to add monetary quantities for sums more than a dollar.

23. The student will be able to add monetary quantities for sums less than a dollar.

24. The student will be able to solve addition problems which contain decimal number addends.

25. The student will be able to express in story form, addition problems which contain decimal number addends.

26. The student is expected to interpret and solve given problems which contain decimal number addends.

27. The student will be able to solve addition problems which contain a decimal and a common fraction as addends.

28. The student will be able to solve addition problems which contain decimal and common fractions as addends.

29. The student will be able to interpret and solve story addition problems which contain decimal and common fractions as addends.

30. The student will be able to interpret and solve story addition problems which contain a mixed number and a decimal number as addends.

31. The student will be able to interpret and solve written addition problems which contain two to four one-digit, two-digit, and three-digit numbers as addends.

32. The student will be able to solve addition problems which contain two or more fractions with unlike denominators as addends.

33. The student will be able to express in story form addition problems which contain two or more fractions with unlike denominators as addends.

34. The student will be able to interpret and solve story addition problems which contain two or more fractions with unlike denominators as addends.

35. The student will be able to express in story form addition problems which contain two or more mixed numbers with like denominator fractions as addends.

36. The student will be able to interpret and solve story addition problems which contain two or more mixed numbers with like denominator fractions as addends.

37. The student will be able to interpret and solve addition problems which contain numbers with decimal fractions as addends.

38. The student will be able to solve addition problems which contain repetitive and non-repetitive decimal fraction addends.

39. The student will be able to solve addition problems which contain common fractions with unlike denominators and decimals as addends.

40. The student will be able to solve addition problems which contain numbers with common and decimal fractions as addends.

41. The student will be able to express in story form addition problems which contain numbers with unlike denominator fractions and numbers with decimal fractions as addends.

42. The student will be able to interpret and solve story addition problems which contain numbers with unlike denominator fractions and numbers with decimal fractions as addends.

43. The student will know and be able to apply the associative principle to addition problems which contain three or more whole number addends.

OBJECTIVES: CVAE SCIENCE (Measurement)

1. Using given materials, the student will be able to differentiate between heavy and light objects.

2. Given five objects of varying weights, the student will be able to order them.

3. Given the necessary materials and instructions, the student will construct a simple balance and demonstrate its use by ordering five objects.

4. Using a beam balance and some provided counter measures, the student will develop a system of weight measurement.

5. Using a given balance calibrated in pounds and ounces, the student will weigh objects stating their weights in the units given on the scale.

6. The student will be able to interconvert in problems involving pounds and ounces.

7. Using a balance calibrated in grams, the student will be able to weigh five given objects stating their weight in grams.

8. Using given materials, the student will be able to identify that volume and weight of a substance are related.

9. The student will be able to interconvert gram and ounce weights.

10. Using given materials, the student will be able to identify the best dollar value by comparing weight and price.

11. Using given materials, the student will be able to differentiate between the terms short and long.

12. Using given materials, the student will identify a need for using linear measurements.

13. Given a set of materials, the student will be able to establish and use a system of measurement.

14. The student will be able to measure a line stating its length in yards, feet, or inches.

15. Using given problems, the student will demonstrate the ability to interconvert problems involving inches, feet, and yards.

16. Using given materials, the student will be able to measure a line stating its length in meters, centimeters, and millimeters.

17. When given objects the same length as units of measure, the student will be able to identify the unit measurement that each object represents.

18. Using given linear units, the student will be able to estimate their lengths in meters, yards, feet, inches, and centimeters.

19. Using given problems, the student will demonstrate the ability to interconvert problems involving meters, centimeters, and millimeters.

20. Using given problems, the student will be able to interconvert U.S. and metric units of linear measurement.

21. The student will be able to order liquid measures of various amounts.

22. Using given containers, the student will identify U.S. liquid measures.

23. The student will be able to interconvert problems involving amounts stated in U.S. liquid measures.

24. Given a volume of liquid and U.S. measuring containers, the student will demonstrate the ability to determine the amount of liquid present.

25. Using given materials, the student will prepare a recipe, using liquid measures of various types.

26. The student will be able to measure a given amount of liquid using a metric graduate.

27. Using given materials, the student will be able to measure the volume and density of an object possessing an unusual shape.

28. The student will be able to interconvert metric measures into U.S. measures.

29. Given a set of items having various temperatures, the student will be able to order them.

30. Given a centigrade and a Fahrenheit thermometer, the student will determine temperatures of materials using both thermometers.

31. Using given problems, the student will interconvert Fahrenheit and centigrade temperatures.

OBJECTIVES: CVAE SCIENCE (Magnetism and Electricity)

1. Given a set of materials, the student will select those materials from the set that are attracted by a magnet.

2. Using given materials, the student will mark the direction of force in pairs of magnets placed in different relationships to each other.

3. Using given materials, the student will identify those materials which magnetic forces will pass through.

4. Using a simple map, the student will describe the directions used in traveling between two given points. (This is a compass activity.)

5. On a given drawing, the student will mark a correct procedure for constructing a magnet from one of four given procedures.

6. On a given drawing, the student will mark the poles of groups of magnets formed by breaking a magnet into two and then four pieces.

7. On an appropriate map, the student will be able to calculate the magnetic declination of any given point on the earth.

8. Using given materials, the student will be able to identify and explain an electromagnet.

9. Given five series of drawings pertaining to static electricity that lead to unstated conclusions, the student will correctly predict each conclusion.

10. On a given drawing, the student will complete the simple electrical circuit by drawing lines indicating the location of the wires in the circuit.

11. On a given drawing, the student will complete the electrical circuit by drawing lines to indicate the wires in the circuit.

12. On a given incomplete drawing, the student will complete the series circuit of three lights and a battery by drawing lines indicating the locations of the wires needed for a complete drawing of the circuit.

13. On a given drawing, the student will complete a parallel circuit by drawing lines to represent the correct wiring of a parallel circuit of three lights.

14. Using a given drawing, the student will complete the circuit involving one appliance with two switches by drawing lines indicating the position of the wires.

15. On a given drawing, the student will complete a circuit involving two switches and an appliance by drawing lines to represent the wires in the circuit.

16. Using a given list, the student will identify those items that will conduct electricity.

17. On a given drawing, the student will complete all of the circuits in a four room house by drawing lines indicating the correct positions for the wires in the drawing.

18. On a given floor plan drawing, the student will draw a wiring plan using electrical symbols.

19. Given a drawing of an electrical cell, the student will be able to label the parts of the cell.

20. Using a meter and a current source, the student will measure the current source expressing his answer in both volts and amperes.

21. The student will write an explanation of the purposes of both the rheostat and the thermostat in an electrical circuit.

22. The student will be able to state two methods for reversing the direction of an electric motor.

23. The student will be able to select the liquids which will conduct current from a selection provided.

24. Using given samples, the student will be able to identify various types of fuses and breakers. The student will write an explanation of the purpose of a fuse in an electrical circuit.

25. On a given drawing, the student will indicate the correct wiring procedure for an electric lamp with a switch.

26. On a given set of drawings, the student will identify electrical hazards by marking an "X" on the hazard.

OBJECTIVES: CVAE ENGLISH LANGUAGE ARTS (Word Recognition)

1. Given a list of words, the student will identify the vowels and the consonants in each word.

2. Given the names of the diacritical marks and their symbols, the student will match each diacritical mark with its correct symbol.

3. Given a list of words that follow the pattern VCV or VCCV, the student will identify the word pattern of each word.

4. Given a list of one-syllable words containing two vowels, one of which is final e, the student will pronounce the word orally and mark the first vowel long and the final e silent.

5. Given a list of one-syllable words containing a vowel digraph, the student will pronounce the word orally and mark the first vowel long, the second silent.

6. Given a list of one-syllable words containing only one vowel in a final position, the student will pronounce the words orally and mark the vowel long.

7. Given sentences, the student will underline all of the words containing long vowels.

8. Given a list of one-syllable words containing one vowel followed by one or two consonants, the student will mark the vowel (short) with a breve and pronounce the word orally.

9. Given sentences, the student will underline all of the words containing a short vowel.

10. Given a list of one-syllable words containing the vowel a followed by r, the student will pronounce the words orally and mark the vowel with a dieresis.

11. Given a list of one-syllable words containing the vowel a followed by re, the student will pronounce the words orally and mark the a with the correct diacritical mark.

12. Given a list of one-syllable words containing the vowel o followed by r, the student will pronounce the words orally and mark the vowel with a circumflex.

13. Given a list of one-syllable words containing the vowels e, i, or u followed by r, the student will pronounce the words.

14. Given a list of words containing the schwa sound, the student will pronounce the words and underline the vowel or vowels in each that is/are replaced by the schwa sound.

15. Given orally a series of words having a single consonant (except c, g, or q) in initial, medial, or final position, the student will identify the consonant.

16. Given words containing the soft and hard sound of c in the initial, medial, or final position, the student will identify the sound and pronounce the words.

17. Given words containing the soft and hard sound of g in the initial, medial, or final position, the student will identify the sound and pronounce the words.

18. Given a list of words containing qu with both the kw and k sounding, the student will pronounce each word.

19. Given a list of words containing consonant blends, the student will identify the blends and pronounce the word.

20. Given an oral model and a list of words containing consonant digraphs, the student will repeat the word, identify the digraph, and specify its position in the word.

21. Given a worksheet on which are printed ten rows of words with four words to a row, the student will circle the word in each row that begins with the same trigraph as the word pronounced orally by the teacher.

22. Given a list of words containing y in initial or final position, the student will pronounce the words and place a c beside those words in which y functions as a consonant and v beside those words in which y functions as a vowel.

23. Given a list of words containing oo, the student will pronounce the words orally and mark the oo according to its sound in that word.

24. Given a group of words containing the vowel diphthong oi and its variant oy, the student will pronounce the word, identify the diphthong and its sound, position and spelling.

25. Given a group of words containing the vowel diphthong ou and its variant ow, the student will pronounce the word, identify the diphthong and its sound, position, and spelling.

26. Given a list of words containing the pattern ow and the key words snow and cow, the student will write each word in the list under its respective key word.

27. Given a list of one-syllable words containing the vowels o or i followed by ld, the student will pronounce the word, and mark the vowel long.

28. Given a list of one-syllable words containing the vowel a followed by ll or lk, the student will pronounce the word, and mark the a as ô.

29. Given three words that follow the same spelling pattern, the student will identify the pattern by adding another word that follows the same pattern.

30. Given a list of words and a set of rules governing silent consonants, the student will pronounce the words and group them under their respective patterns.

31. Given a list of words, written phonetically, the student will write the correct form of the word.

32. Given a list of words containing vowel trigraphs, the student will identify the trigraph and pronounce the word.

33. Given a list of words, the student will cross out all silent vowels and count all sounded vowels to ascertain the number of syllables in each word.

34. Given a list of words, the student will count the number of syllables in each word, and classify each as a monosyllable, a dissyllable, a trisyllable, or a polysyllable.

35. Given a list of words containing prefixes and/or suffixes, the student will separate the affixes from the root word to form syllables.

36. Given a list of two-syllable compound words, the student will divide the words into syllables.

37. Given a list of two-syllable words containing an x in medial position, the student will divide the word after the x.

38. Given a list of two-syllable words containing a ck in medial position, the student will divide the word after the ck.

39. Given a list of two-syllable words ending in le preceded by a consonant, the student will divide the word before the consonant.

40. Given a list of words with VCCV pattern, the student will divide the word between the consonants.

41. Given a list of words with VCV pattern, the student will divide the word after the first vowel if the sound of the first vowel is long.

42. Given a list of words with VCV pattern, the student will divide the word after the consonant if the sound of the first vowel is short.

43. Given a list of words, the student will divide them into syllables and classify each syllable as open or closed.

44. Given a list of words, each having the first vowel followed by a blend or a consonant digraph, the student will divide the word after the vowel, if the vowel is within an open syllable.

45. Given a list of words, each containing three consonants in medial position, the student will divide the word between the first consonant and the blend or digraph.

46. Given the past tense of regular verbs, the student will identify the root word ending and will divide the word into syllables.

47. Given a Haiku poem (17-syllable poem about one image or presenting a single picture to create a mood), the student will rewrite the poem in syllables.

48. Given a list of words containing specific prefixes (de, pro, un, com, ex, in, per, re, pre, dis), the student will identify each prefix and state its meaning.

49. Given a list of words containing specific suffixes (ful, ly, ment, tion, ous, able, age, ive), the student will identify each suffix and its function.

50. Given a set of words derived from one root word, the student will identify the root from which each set is derived.

51. Given a set of sentences containing designated words in the correct possessive form, the student will write the correct possessive form of these words.

52. Given sets of specified words, the student will write the correct abbreviation for each word.

53. Given a list of disjointed compound words, the student will write each compound word correctly as one word, as hyphenated-compound word, or as two separate words.

54. Given a list of phrases that can be contracted, the student will write the contraction for each.

55. Given a list of regular verbs, the student will write word variants by adding s, ed, and ing to each verb, and using each form in a sentence.

56. Given a set of sentences containing new words, the student will use the context of the sentence to define each new word.

OBJECTIVES: CVAE SOCIAL STUDIES (Culture)

1. Given a series of pictures showing a man driving a car, a young girl water skiing, a man driving a bulldozer, a young boy eating with chopsticks, and a young lady eating with a knife and fork, the student will be able to identify culture traits.

2. Given a series of pictures showing a man wearing glasses, a man wearing a hat, a woman wearing a ring in her nose, a boy wearing wooden shoes, a boy eating with chopsticks, and a woman wearing lipstick, the student will be able to distinguish between a universal trait and a variation trait.

3. Given a series of pictures showing a young man born and raised in the suburbs of Dallas, Texas, a boy born and raised in Port Mansfield, Texas, and a girl born and raised around Nacogdoches, Texas, the student will identify these people as natives of the area in which they were born and raised and, thus, generally will acquire the culture traits common to that area.

4. Given a series of pictures showing a commercial shrimper hoisting a net full of shrimp, a professional football player running for a touchdown, a professional golfer hitting a hole-in-one, a welder welding two pipes together and a plumber fixing a sewage line, the student will identify these actions as occupational culture traits commonly acquired by all people who work in specific jobs.

5. Simulating basic living conditions in a family-type unit and a household-type unit, the student will identify the two units for differences in social organization.

6. Given a picture of a mother at home teaching her child to walk and a picture of a father at home teaching his son to use tools, the student will identify these actions as culture traits, usually acquired at home, a practice known as rearing.

7. Given a series of pictures showing a United States school classroom and an English public school classroom, the student will identify these school units as locations (learning institutions) where culture traits are transmitted and acquired.

8. Given a series of pictures showing a young man purchasing a token on a public bus, a man inserting a quarter in a parking meter, and a young lady purchasing a ticket in a theater, the student will identify these actions as culture traits acquired in the community.

9. Given a series of pictures showing a plumber, professional football player, a teacher, and a doctor, the student will identify these people as similar yet different in relationship to each other. (physically, mentally, and emotionally)

10. Given a chart listing the distinct hereditary Hindu social classes, a chart listing the Spanish caste system of the Spanish Colonial Period based on birth and wealth and a chart listing the present American social status system based principally on wealth and occupation, the student will compare these social class systems for identifying culture behavior patterns.

11. Given a list of characteristics of a primative culture and a list of characteristics of a civilized culture, the student will identify and compare them for similarities and differences.

12. Given a series of pcitures of people in different stages of growing up, ages 5-12, 13-16, 17-18, 21-30, 40-50, and 60-80 respectively, the student will recognize that as people grow up (mature, regardless of their culture background) they share common maturity culture traits with their peers that change only with experience and time.

13. Given a newspaper clipping printed in the Spanish language, a magazine clipping in the French language, and a paperback in the English language, the student will recognize the necessity of language to a culture in order to have the best type of communication.

14. Given a tape of a conversation in the French language, a tape of a conversation in the Spanish language, and a tape of a conversation in the English language, the student by listening to the tapes will recognize the necessity of language to a culture in order to have the best type of communication.

15. Given a picture of a fountain pen, a picture of a skillet, a picture of a percolator, a picture of a dune buggy, and a picture of a minibike, the student will recognize that the words which are attached to these inventions become part of a person's vocabulary and, thus, additional culture traits.

16. Given a list of specialized vocabulary words commonly used by Americans of different culture backgrounds as a way of life, the student will identify the use of these words as slang and outside of formal use.

17. Given a series of pictures showing a teenager biting her nails, a young boy yawning in church, a man putting on his rubber boots, and a woman carrying an umbrella, the student will identify these actions as habits that some people acquire as a part of their culture traits.

18. Given a series of pictures showing a Scotsman wearing a kilt, a Japanese man removing his shoes before entering his house, and a woman wearing a white dress and veil on her day of marriage, the student will identify these actions as customs usually acquired by tradition by people of different cultures.

19. Given four lists of customs and habits in the United States characteristic to the Negro-American culture, the Mexican-American culture, the Italian-American culture, and the Indian-American culture respectively, the student will identify these culture traits as significant factors in the ways that people behave.

20. Given a list of sayings in three different cultures: French, Spanish, and English respectively, the student will identify these verbal sayings as culture traits usually acquired by tradition.

21. Given a picture of an Indian-American wearing a string of beads, a picture of a young lady wearing a set of earrings, and a picture of a young man smoking a cigarette, the student will identify these actions as nonverbal culture traits common in some form to many cultures.

22. Given a picture of a young man waving to a young girl to "come on", a picture of an umpire indicating that a baseball player has struck out, and a picture of a man indicating that a cup of coffee is bitter, the student will identify these actions as gestures that are common to most cultures and accepted as proper or good (moral).

23. Given a picture of the Statue of Liberty, a picture of the Jewish Star of David, a picture of a Christian crucifix, and a picture of the American flag, the student will identify these items as symbols used by different cultures to express an idea or a set of ideals.

24. Given a tape of a Texan making a "woopee" sound, a young girl laughing at something humorous, a Mexican making a "grito" sound, an Indian sounding like a coyote, and a Mexican making a wailing sound at a funeral, the student will identify these types of sound-making actions as common to many cultures.

OBJECTIVES: CVAE SOCIAL STUDIES (Americanism)

1. Given a series of pictures showing five members of an American family watching television, three members of an American family playing baseball, two members of an American family practicing the playing of a piano, the student will identify these traits as part of the American way of life.

2. Given a series of pictures showing a Mexican dinner dish (tacos, enchiladas, rice, beans), and an Italian dinner dish (spaghetti and meatballs), and an American dinner dish (meatloaf, mashed potatoes and peas), the student will identify these dinners as a part of the American way of life.

3. Given a series of pictures of American housing units (apartments, houses, trailers), the student will be able to recognize the significance of housing to American living habits and attitudes toward the American way of life.

4. Given a picture of a boy wearing Levis, a girl wearing a suit, and a girl wearing a skirt, the student will identify these items of clothing as commonly worn in America as part of the American way of life.

5. Given a list of community, professional, and civic organizations and a list of community activities or projects sponsored by these organizations, the student will identify these organizations and activities or projects as common to the American way of life.

6. The student, by identifying three different types of educational institutions and their functions, will demonstrate the ability to recognize the importance or significance of education to Americans.

7. The student, by comparing a group of "blue collar" jobs (plumber, electrician) to professional status positions (teacher, lawyer, doctor), will demonstrate his ability to identify the American social status system.

8. Given a list of occupations common to the American "world of work" and their functions to study, the student will be able to recognize job satisfaction, importance to income, and security offered by the American way of life.

9. Given a chart of the number of employed youths of various ages in various occupations and a list of the number of unemployed youths of various ages, the student will be able to compare the two to recognize that unemployment is a critical problem of youths in America.

10. Given a chart indicating statistics on the crime rate in the United States, the student will recognize the seriousness of crime to the welfare of American society.

11. Given a series of pictures showing a tent camper, a fishing pole, a bowling alley, and a football game in action, the student will be able to recognize America's trend for leisure and recreation.

12. Given a list of television programs or a television guide and a list of current movies showing in the local theaters, the student will recognize television and movies as one of the principal means of entertainment in the United States.

13. Given a copy of the United States Constitution, the student will identify the document as the final authority of the United States of America.

14. Given immigration statistics of people coming into the United States for the years 1911-1920, 1951-1960, and 1968, the student will recognize the significance of immigration flow to the development of the United States of America.

15. Given a list of history facts describing the World Warr II period in the United States, the student will recognize the significance of history reflections to attitudes in the American way of life.

16. Given a list of facts and generalizations, the student will be able to distinguish between myths and reality in relation to ways of life in the United States of America.

17. Given a list of American culture traits, the student will identify five factors that cause (affect) continuous culture change.

18. Given a list of sports, the student will select the sports that best depict the American way of life.

19. Given three dates and holidays: St. Valentine's Day (February 14), New Year's Day (January 1), and Halloween (October 31), the student will recognize that these are examples of days celebrated by tradition in America.

20. Given a list of religions, the student will recognize that the United States is basically a Protestant oriented country with guaranteed freedom of religion by the United States Constitution and that it prides in its self-imposed spirit of tolerance for other religions.

21. Given a list of descriptions of American attitudes toward work, time, and play, the student will identify these attitudes as American.

22. Given a picture of a United States fighting Marine and a picture of a neatly attired homestead, the student will identify respectively the personal value of courage and the human value of dignity in the American tradition.

23. Given a list of articles, the student will demonstrate his ability to recognize American consumer habits by simulating purchases on a cash basis and purchases on a credit basis of several of the articles.

24. Given a list of American health habits and practices, the student will identify them as common to Americans.

25. Given a list of Americanisms, the student will be able to recognize these as typical (common) American sayings and words in the American way of life.

26. Given a series of pictures of Americans at home, at work, and at play, the student will select those that describe an appropriate image of the American way of life.

27. Given a picture of a power mower, a model of an oil derrick, a model of a bulldozer, a picture of a football player in action, a picture of a victorious politician, and a model rocket, the student will recognize the many expressions (manifestations) of the power in the American way of life.

28. Given a picture of a successful business man, a doctor, a rancher, a picture of newly weds, a family album, a person winning a new automobile, a couple going into their new home, a boy with a new football, and a girl with a new doll, the student will recognize the meaning of American ideals.

29. Given a list of veteran, military, and patriotic groups and a list of professional, labor, and business groups, the student will recognize the role of leadership in the American way of life.

30. Given a series of pictures showing the corporation General Motors, General Electric, Texaco, Standard Oil (California), and Krogers, the student will identify these industries as examples of the backbone of American economy and the welfare of American society.

31. Given a picture of the Kennedy family (President Kennedy's family), a picture of the King Ranch, a picture of a Hilton Hotel, a picture of Boulder Dam, and a picture of Humble Oil Company, the student will identify these pictures as expressions of America's wealth.

32. Given a picture of a U-Haul trailer, a picture of a moving van, and a picture of a mobile-type trailer, the student will identify these pictures as symbols of America's mobility.

33. Given a series of pictures of a Pan American 707 Boeing Jet airliner, a charter bus enroute from Texas to Guadalajara, Mexico, and Sanborn's travel agency, the student will identify these pictures as symbols of America's trend for travel to other parts of the world.

OBJECTIVES: CVAE SOCIAL STUDIES (Humanity)

1. Given a series of pictures showing a group of Africans, the student will identify members of the Negroid race by observing three distinct characteristics or traits of this race.

2. Given a series of pictures showing a group of Europeans, the student will identify members of the Caucasoid race by observing three distinct characteristics or traits of this race.

3. Given a series of pictures showing a group of Asians, the student will identify members of the Mongoloid race by observing three distinct characteristics or traits of this race.

4. Given a picture of a mother weeping over her dead son killed in the Viet Nam War, the student will recognize that it is human nature to weep when a person dies.

5. Given a picture of a young lady losing her temper and striking her boyfriend with her purse, the student will recognize that all persons have an animal nature which makes them imperfect.

6. Given a map of the World, the student will demonstrate his ability to identify these nations: France, England, the United States of America, Germany, and Japan.

7. Given a picture of a man and a woman, the student will identify these as examples of people (human beings) that have multiplied themselves (reproduced) and have formed what is known as humanity.

8. Given a picture of a mother feeding a bottle of warm milk to her child, the student will identify this act as an example of satisfying a human need.

9. Given a picture of a father purchasing a red wagon for his son, the student will identify this act as an example of satisfying a human want.

10. Given a chart showing a family tree, the student will demonstrate his ability to identify his grandfather, grandmother, great-grandfather, and great-grandmother as his ancestors.

11. Given a picture of a young girl afraid to go up in an airplane (fly), the student will recognize that fear of the unknown is a natural feeling that may be overcome by a person confronted with it.

12. Given a chart listing, in both English and Spanish, the names attached to certain relations between relatives (niece, nephew), the student will identify the use of words (language) as an example of a means of communication by humanity.

13. Given a picture showing a group of newborn babies in a hospital ward, the student will recognize that there are over 8,000 babies born in the United States every day; over 100,000 babies are born daily throughout the world and that it is natural for human beings to reproduce themselves.

14. Given a picture of a funeral taking place, the student will recognize that over 100,000 human beings die in the world within a 24-hour period and that more people are born than die.

15. Given a picture of a father and his brother and the r two respective sons, the student will recognize that the two sons are first cousins.

16. Given a picture of two first cousins and their two sons, the student will recognize that the two sons are second cousins.

17. Given a case example of a man and a woman who have obtained a divorce (divorcee), the student will recognize the fact that one out of three marriages in the United States (1960 census) end in divorce.

18. Given a picture of a man, his sister, and his sister's son, the student will identify the sister's son as the man's nephew.

19. Given a picture of a man, his sister, and his sister's daughter, the student will identify the sister's daughter as the man's niece.

20. Given a picture showing a boy's father, mother, his father's sister, and his mother's brother, the student will identify the father's sister and the mother's brother as the boy's aunt and uncle.

21. Given a picture of a boy, his father, his grandfather, his great-grandfather, and his great-great-grandfather, the student will identify these people as members of five generations respectively.

22. Given a picture showing a man and a woman, their son and their son's daughter, the student will identify the son's daughter as the granddaughter of the man and the woman.

23. Given a picture showing a man and a woman, their son and their son's son, the student will identify the son's son as the grandson of the man and woman.

24. Given a picture showing a father, his daughter and the daughter's husband, the student will identify the father as the husband's father-in-law.

25. Given a picture showing a mother, her daughter, and the daughter's husband, the student will identify the mother as the husband's mother-in-law.

26. Given a picture of a man, his wife, and her brother, the student will identify the wife's brother as the man's brother-in-law.

27. Given a picture of a man, his wife, and his wife's sister, the student will identify the wife's sister as the man's sister-in-law.

28. Given a picture of a man, his wife, their daughter, and his wife's daughter by a previous marriage, the student will identify the two daughters as half-sisters.

29. Given a picture of a man, his wife, their daughter and his wife's son by a previous marriage, the student will identify the son as the daughter's half-brother.

30. Given a picture showing a girl, her mother and her mother's husband whom she married after her (the girl's) father's death, the student will identify her mother's husband as her stepfather.

31. Given a picture showing a girl, her father, and her father's wife whom he married after the girl's mother's death, the student will identify her father's wife as her stepmother.

32. Given a picture of a boy, his stepfather, and his stepfather's son, the student will identify the stepfather's son as the boy's stepbrother.

33. Given a picture of a boy and his stepfather's daughter, the student will identify the stepfather's daughter as the boy's stepsister.

34. Given a picture of a man, his wife, and his wife's son by a previous marriage, the student will identify the man's wife's son as the man's stepson.

35. Given a picture of a man, his wife, and his wife's daughter by a previous marriage, the student will identify the man's wife's daughter as the man's stepdaughter.

36. Given a picture showing a young child being baptized by a priest with a man and a woman present as witnesses, the student will identify the man as the child's godfather.

37. Given a picture showing a young child being baptized by a priest with a man and a woman present as witnesses, the student will identify the woman as the child's godmother.

38. Given a picture showing a young boy being baptized by a priest with a man and a woman present as witnesses, the student will identify the young boy as the godson of the witnesses.

39. Given a picture showing a young girl being baptized by a priest with a man and a woman present as witnesses, the student will identify the young girl as the goddaughter of the witnesses.

40. Given a picture of a young boy whose father and mother have both been killed in an automobile accident, the student will identify the boy as an orphan.

PROJECT STAFF

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Fourteen years experience in education as teacher, Science Department Head, Migrant Student Science Consultant, Regional Curriculum Department Coordinator. B.A. degree, Pan American University; M.S. degree, Texas A & I University.

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